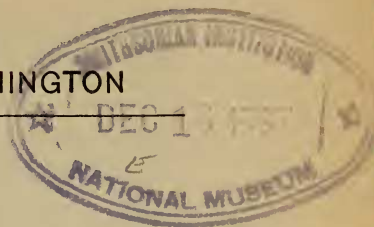


PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

---



ON THE FLIGHTLESS HERON OF RODRIGUEZ.

BY THE MARQUESS HACHISUKA, PH. D., SC. D.

---

In 1708 Leguat published an account of the Rodriguez Flightless Heron which is translated into English as follows: "We had abundance of Bittern, as big and as good as Capons; they are tamer, and more easily to be caught than Woodhens." He writes further, a few pages later, about an interesting account of lizards where he again mentions the herons. "The Palmtrees and Plantanes are always loaden with Lizards about a foot long, the Beauty of which is very Extraordinary; some of them are blue, some black, some green, some red, some grey, and the colour of each the most lively and bright of any of its kind. Their common Food is the Fruit of the Palm-Trees. They are not mischievous, and so Tame, that they often come and eat the Melons on our Tables, and in our Presence, and even in our Hands; they serve for Prey to some Birds, especially the Bitterns. When we beat 'em down from the Trees with a Pole, these Birds wou'd come and devour them before us, tho' we did our utmost to hinder them; and when we offer'd to oppose them, they came on still after their Prey, and still follow'd us when we endeavour'd to defend them."

The anonymous author of the manuscript "Relation du ils Rodrigue" (cf. Ann. Sci. Nat., (6) 11, p. 133 et seq., 1875) about the year 1830 mentions this bird as follows: "There are plenty of Bitterns which are birds which only fly a little and run perfectly well when they are chased. They are of the size of an Egret (aigrette) and something like them." This unknown author seems to be not very careful in his observation. He writes that the bird was able to rise from the ground even for a short moment. This appears an unlikely occurrence after we examine the remains of the sternum and wing which clearly indicate that the bird did not have the power of flight. If the anonymous author's experience was correct it must have happened on a sloping ground.

In 1873, on the basis of a few osteological remains found on that island Milne-Edwards described, a heron believed to be identical to the bird of which Leguat speaks; and called it *Ardea megacephala*, considering it to be a true *Ardea*; finding the fore-part of its frontal region flat as in a heron, whilst this part being concave in *Nycticorax*, he dismissed the question of the affinity to the latter.

H. H. Slater brought home, as commissioned naturalist on board the Transit of Venus, 2,000 Solitaire remains. Along with them were additional material of the present heron. In 1879 Gunther and Newton, with the aid of this richer material published the conclusion that *A. megacephala* ought to be close to the European Night Heron, so united them under the genus *Nycticorax*. Rothschild, however, placed it into *Ardea* in his "Extinct Birds," (1907).

Here I quote from Günther and Newton and repeat in full: "The distinctive features of the skull common to the European and Rodriguez Night-Herons are:—first the great width of the occipital region; then the mastoid processes, which are as distant from each other as the temporal; the relative distances between the mastoids, temporal, and postorbital processes are the same in both birds. The temporal fossa is nearly of the same width; the foramen occipital is broader than deep, more as in the Rodriguez species than in *N. nycticorax*, the arch of the supraorbital margin is in both much more open than in the Heron; the prænasal groove is equally deep, and extending equally far forwards; the bill of the Rodriguez species is not less curved downwards than in *N. nycticorax*, though the bill is equally slight in either. The bill of *N. megacephalus* is much stronger than in the European bird, but not more so than in other species of this genus. The principal difference between these skulls is that that of the Rodriguez species is much more depressed, with scarcely any transverse and longitudinal depression near the base of the bill; it is also a little longer.

The evidence gathered from a comparison of the pelvis leads to the same conclusion. The praecetabular portion is nearly equally narrow and constricted; the anterior iliac blades coalesce for a short distance only, leaving a great part of the sacral crest uncovered. The width of the postacetabular half, and the arrangement of the foramina, pleurapophyses, etc., are nearly the same.

	<i>N. megacephalus</i>	<i>N. nycticorax</i>
Length of pelvis.....	63 mm.	61 mm.
Width in its narrowest part.....	15 mm.	14 mm.
Greatest width above acetabulum.....	35 mm.	33 mm.

The pelvis of *Ardea cinerea* has length of 82 mm., and a greatest width of 39 mm., and is therefore in general shape (as well as in other details of configuration) widely different from that of *Nycticorax*.

Taking the pelvis as guide, the body of the Rodriguez Night-Heron was of nearly the same size as that of *N. nycticorax*; the cranium also was nearly of the same size; while the bill and mandible were much stronger,

and in accordance with this powerful development of the maxillary apparatus, the cervical portion of the vertebral column was proportionally stouter than in *N. nycticorax*.

The reduction of the power of flight has been already demonstrated by M. Milne-Edwards, and we are able to corroborate his opinion by completing the measurements of the sternum and wing in comparison with the European Night-Heron:

	<i>N. megacephala</i>	<i>N. nycticorax</i>
Length of sternum.....	64 mm.	69 mm.
Breadth of sternum.....	34 mm.	37 mm.
Greatest depth of keel.....	14 mm.	20 mm.
Length of scapula.....	72 mm.	72 mm.
coracoid.....	55 mm.	60 mm.
humerus.....	114 mm.	126 mm.
ulna.....	121 mm.	139 mm.
radius.....	117 mm.	133 mm.
metacarpus.....	62 mm.	70 mm.

It will be observed from this table that while all the bones of the wing have been reduced in length "and strength," the scapula has not been affected. As regards form, it is exactly the same as in other Herons, viz., tapering behind, without dilation.

With regard to the leg, M. Milne-Edwards, guided in his estimate of the general size of the bird by the length of the skull and femur, inferred that this part of the osseous frame was much reduced in length. Having shown from the pelvis, with which M. Milne-Edwards was not acquainted, that the body of this bird was considerably less in size than he supposed, in fact equal to that of the European Night-Heron, we arrive at the opposite conclusion, viz., that the leg is proportionally much more developed in length and strength. And this will be readily perceived from the following table:

	<i>N. megacephala</i>	<i>N. nycticorax</i>	<i>Ardea cinerea</i>
Length of femur.....	86 mm.	82 mm.	89 mm.
tibia.....	136 mm.	136 mm.	185 mm.
metatarsus.....	93 mm.	89 mm.	139 mm.
Width of metatarsus.....	6½ mm.	4 mm.	---
Length of 2d phalanx of inner toe.....	20 mm.	19 mm.	26 mm.
Length of 1st phalanx of hind toe.....	30 mm.	28 mm.	35 mm.

In this table we have added also the corresponding measurements of the Heron, in order to show that the Rodriguez bird agrees with *Nycticorax*, and differs from *Ardea* in the length of the femur as compared with that of tibia and metatarsus. The metatarsus and phalanges are the parts in which the greatest development has taken place, the thickness of these bones being nearly twice as great as in *N. nycticorax*, the bird having been

clearly of much more cursorial habits than its congeners, chasing rather terrestrial animals (lizards) than aquatic.

Thus the effect of the prolonged isolation on the two vertebrate-hunting birds of Rodriguez, the Owl and the Night-Heron, was precisely the same. Without losing the power of flight, they became brevipennate; but the increased development of the legs compensated for the reduction of this power, and enabled the one to destroy animals of larger size when the smaller kinds became scarcer, and the other to chase its swift-running prey. In the Night-Heron the increase of development was confined to the legs in conformity with its acquired habit; and it was principally the metatarsus which became enlarged to receive and form a base for the tendons of the foot. But the Owl required additional strength for the purpose of mastering and tearing its prey, not only in the muscles of the lower leg, but also in those attached to the trunk, and hence we find in this bird the greatest development in the femur and pelvis.

We have before us sufficient osteological specimens to prove that the Rodriguez Flightless Heron is but little related to any Herons known to us, both existing and extinct; therefore I propose a new Genus and call it:

**MEGAPHOYX, gen. nov.**

Type, *Ardea megacephala* Milne-Edwards.

“Butors” Leguat, *Voyages et Avantures*, 1708.

*Ardea megacephala*, Milne-Edwards, *Ann. Sci. Nat.* (5) XIX. p. 10, 1874.

*Ardea megacephala* of Milne-Edwards; Newton, *Proc. Zool. Soc.*, p. 41, 1875.

*Nycticorax megacephala*, Günther and Newton, *Philos. Trans.* Vol. 168, p. 43, 1879.

“Bittern” Leguat, “*Voyage of Francois Leguat, etc.*” Vol. I, pp. 81 and 86, 1891.

“Butors,” Anonymous, “*Relation de l’Ile Rodrigue*” Prior to 1730.

*Ardea megacephala* Rothschild, “*Extinct Birds*,” p. 111, 1907.

*Ardea megacephala*, Lambrecht, “*Handbuch der Palaeornith.*” p. 313, 1933.

Head very large; legs proportionately to the head are very short. The sternum is puny and small in comparison to the size of the bird, proving clearly it had no power of flight. The genus is quite remarkable among the herons and not closely related to *Ardea* or *Nycticorax* as formerly believed.

I am puzzled as to why Leguat called it a “Bittern.” The only probable meaning I can find is that Leguat pointed out the general coloration of the plumage which reminded him of bitterns of his native France, which have buffish feathers mottled with black.

The anonymous author says “They are of the size of an Egret and something like them.” Egret is a pure white bird and if “something like them” meant to point out the significance in color it does not support Leguat’s statement. It is best for the time not to place importance to this as we already have proofs of its inaccuracy for flight.

It is worth noting here a few examples of birds that, due to sedentary

habitat, have lost their power of flying, although their close allies are distributed over a large portion of the world. Those are:

<i>Porphyrio</i>	<i>Notornis</i> and <i>Cyanornis</i>
<i>Alca</i>	<i>Pinguinus</i>
<i>Phalacrocorax</i>	<i>Nannopterum</i>
<i>Porzana</i>	<i>Atlantisia</i>
(especially <i>bicolor</i> and <i>tabuensis</i> )	

Among the species we may note *Scolopax rusticolus* and *S. mira*. Mr. Peters is wrong in his "Birds of the World," vol. II, p. 276, in considering *Mira* as a race because it is well known to the Japanese ornithologists that both birds breed on the same island. The present article is a continuation of my study on the extinct avifauna of the Mascarene Islands, the first of which is "Revisional Note on the Didine Birds of Reunion," *supra*, vol. 50, pp. 69-72, May 6, 1937. The second is "A proposed new genus, *Kuina*, and a description of a new Rail, *Kuina mundyi*, from Mauritius." *Bull. Brit. Orn. Club*, cccvi, p. 154-157, 1937.